

REMARKS

Upon entry of the instant Amendment, claims 1 and 3-44 will be pending in the application. Claims 1 and 31 are independent. Claims 3-7, 9-11, 13, 15, 20, 25, 28, 29, 33, 34, 37-39 and 42-44 stand withdrawn by the Examiner. By this amendment, claims 1 and 3 will have been amended and claim 2 will have been canceled. Support for the amendment to claim 1 can be found in at least original claim 2. No new matter is added. Reconsideration of the rejections in view of the above amendments and the following remarks is respectfully requested.

Restriction Requirement

The Examiner has indicated that the following claims 3-7, 9-11, 13, 15, 16, 20, 25, 28, 29, 34, 37-39 and 42-44 are withdrawn from examination on the basis of an election of species. Applicant submits, however, that the Examiner has incorrectly listed claim 16 as being withdrawn because this claim was treated on the merits in the instant Office Action. Moreover, the Examiner has failed to address the status of claim 33 as this claim was neither treated on the merits nor indicated as being withdrawn. Accordingly, clarification is requested with regard to the status of these claims. Finally, inasmuch as the withdrawn claims depend from generic claims 1 and 31, Applicant requests rejoinder of the withdrawn claims if and when claims 1 and 31 are found to be allowed or allowable.

Objection to the Specification

The specification was objected to on the basis of 35 U.S.C. § 112, first paragraph. Applicant respectfully submits that this objection is improper and inconsistent with current USPTO rules.

There is no legal basis for objecting to the specification on the basis of 35 U.S.C. § 112, first paragraph. As the Examiner well knows, while 35 U.S.C. § 112, first paragraph, may form a basis for rejecting the claims it cannot for a proper legal basis for objecting to the specification. Applicant reminds the Examiner that objections are based on USPTO rules and rejections are based on US Patent laws. 35 U.S.C. § 112, first paragraph, is a US patent law, not a rule, and therefore may form a basis for supporting a rejection - not an objection.

Moreover, MPEP § 2163 makes clear that a rejection under 35 U.S.C. § 112, first paragraph must address whether the claims are adequately supported by the written description and whether the claims are enabled by enabling disclosure. A rejection under 35 U.S.C. § 112, first paragraph, necessarily requires a comparison of the claim features to the specification. The specification is not evaluated independently of the claims when evaluating compliance with 35 U.S.C. § 112, first paragraph.

Thus, as this basis of objection is entirely improper and contrary to current USPTO rules, Applicant respectfully requests that the Examiner withdraw this basis of objection.

35 U.S.C. § 112, first paragraph

Claims 1, 2, 8, 12, 14, 16-19, 21-24, 26, 27, 30-32, 35, 36, 40 and 41 were rejected to on the basis of 35 U.S.C. § 112, first paragraph. Applicant respectfully traverses each of the Examiner's assertions.

The Examiner asserts that there is inadequate written description and enablement with regard to how and what manner a single pressure wave can alone produce the recited oscillation so as to result in standing waves and generate electricity.

Applicant submits that the Examiner has misconstrued the claims and has misunderstood and misapplied the requirements of 35 U.S.C. § 112, first paragraph. The claims do not require or recite a single pressure wave nor does the specification specify that only a single pressure wave is used. Indeed, independent claims 1 and 31 recite "at least one pressure wave" is generated. Such language is hardly limited to a single pressure wave. Nor has the Examiner identified any language in the instant application supporting the Examiner's allegation that Applicant has limited the invention to the use of a single pressure wave.

Furthermore, the Examiner has clearly misunderstood and misapplied the requirements of 35 U.S.C. § 112, first paragraph, which merely requires a comparison of the claims to the specification to determine whether each feature recited in the claims is supported by adequate written description and enablement in the specification. In this case, the claims recite the generating of "at least one pressure wave". Moreover, the last paragraph of page 14 of the specification clearly explains that the actuator can generate "pressure waves to start the process" (emphasis added). With regard to the

enablement requirement, Applicant submits that the specification, and specifically pages 14-18, explains and describes all of the features required to generate the pressure wave and the Examiner has not shown otherwise.

With regard to the Examiner's assertion that Applicant has not explained how and in what manner the device is operative to produce nuclear fusion, Applicant submits that the device shown and described is believed to be sufficient to conduct experiments which will produce at least some nuclear fusion. At the very least, the device is believed to contribute the experimental research that is required to one day produce nuclear fusion.

With regard to the Examiner's assertion that Applicant has not explained how and in what manner the device is operative to create and maintain the indicated pressure waves, Applicant submits that the device shown and described produces the recited pressure waves and the Examiner has not demonstrated otherwise. Indeed, Applicant has described each of the features required to perform the features recited in the claims in the specification such as the piezo material actuator and the control and power unit C.

The Examiner also asserts that Applicant has not provided sufficient enabling disclosure with regard to the working fluid parameters and fusion gas parameters. Applicant reminds the Examiner that the specification identifies a number of working fluids such as water, gasoline, and alcohol (see page 9, last paragraph). Moreover, the paragraph bridging pages 11 and 12 and page 12 of the specification notes desirable pressures and temperatures for the fluid. Additionally, such fluids are clearly known to

one of ordinary skill in the art. Finally, pages 13 and 14 of the specification explains the desirable gases and the desirable size of the gas bubble. Applicant emphasizes that such fluids and gasses are clearly know to one of ordinary skill in the art of fusion reactors and the Examiner has not shown otherwise.

The Examiner further asserts that Applicant has not provided sufficient enabling disclosure with regard to the control and conditioner and alleged that such devices are essentially a "black box". Applicant reminds the Examiner that the enablement and written description requirement are evaluated on the basis of claim scope. Claims which broadly recite a control and a conditioner, and which broadly explain their function, can properly be supported, for purposes or enablement, by correspondingly broad disclosure explaining the same. Such features need not be supported with detailed descriptions. Moreover, Applicant has described the invention with sufficient detail to enable one having ordinary skill in the art of fusion reactors to make and use the invention as broadly claimed, and the Examiner has not demonstrated otherwise.

The Examiner further asserts that any fusion reactions which would occur would actually disrupt wave oscillations and that Applicant has provided "no reputable basis" supporting Applicant's assertions with regard to the functioning of the device. Applicant submits that the Examiner has failed to support this allegation with any evidence. Applicant reminds the Examiner that the test for enablement is whether undue experimentation is required to make and use the invention as claimed. Applicant submits that Applicant has described the invention with sufficient detail to enable one having ordinary skill in the art of fusion reactors, without undue experimentation, to

make and use the invention as claimed, and the Examiner has not demonstrated otherwise.

Finally, the Examiner asserts that the specification fails to provide sufficient enabling disclosure with regard to the “calibrated deuterium-tritium gas bubbles” in claim 24. Applicant submits that the first paragraph of page 13 of the specification clearly describes this feature and provides sufficient explanation as to what is meant by this term. Indeed, the cited language explains bubble sizes and the parameters for sizing the bubbles. Applicant again submits that Applicant has described the invention with sufficient detail to enable one having ordinary skill in the art of fusion reactors, without undue experimentation, to make and use the invention as claimed, and the Examiner has not demonstrated otherwise.

Thus, Applicant respectfully traverses each and every assertion of the Examiner and submits that this basis of rejection is entirely improper and contrary to current USPTO rules.

Accordingly, Applicant respectfully requests that the Examiner withdraw this basis of rejection.

35 U.S.C. § 112, second paragraph

Claims 1, 2, 8, 12, 14, 16-19, 21-24, 26, 27, 30-32, 35, 36, 40 and 41 were rejected to on the basis of 35 U.S.C. § 112, second paragraph. Applicant respectfully traverses each of the Examiner’s assertions.

The Examiner asserts that the claims are vague, indefinite and incomplete as to how and in what manner a single pressure wave alone can generate electrical energy.

As explained above, the Examiner misconstrues the claims and has misunderstood and misapplied the requirements of 35 U.S.C. § 112, second paragraph. The claims do not require or recite a single pressure wave nor does the specification specify that only a single pressure wave is used. Indeed, independent claims 1 and 31 recite “at least one pressure wave” is generated. Such language is hardly limited to a single pressure wave. Nor has the Examiner identified any language in the instant application supporting the Examiner’s allegation that Applicant has limited the invention to the use of a single pressure wave. Moreover, as noted above, the last paragraph of page 14 of the specification clearly explains that the actuator can generate “pressure waves to start the process” (emphasis added).

Furthermore, a rejection based on 35 U.S.C. § 112, second paragraph, requires a comparison of the claims to the specification and must take into account what is known in the art. In this case, the Examiner has alleged that the claims are vague and indefinite but failed to specify which claim features are vague and/or which features would not be understood by one having ordinary skill in the art. Accordingly, a *prima facie* case of indefiniteness has not been properly set forth.

The Examiner also asserts that “the metes and bounds of the claims cannot be determined.” However, completely absent from the Examiner’s allegations is any explanation as to which features have undetermined metes and bounds. As explained above, the claims must be evaluated on the basis of the disclosure and what is known in the art. Under this basis, Applicant submits that each feature recited in the claims would be understood by one having ordinary skill in the art, and the Examiner has not

shown otherwise.

The Examiner additionally asserts that the feature “the working fluid” in claim 1 lacks proper antecedent basis. This assertion is incorrect. Claim 1 recites the feature “a working fluid” on line 2 which provides antecedent basis for “the working fluid” on line 6 of claim 1.

The Examiner also asserts that the features “one or more pressure sensors” and “control and power unit” in claim 21 lack proper antecedent basis. Such assertions are incorrect and/or improper. As the Examiner will note, these features are not preceded by the terms “the” or “said” so as to imply a reference to a previous recitation of the feature. Instead, they are recited for the first time without the preceding terms “the” and “said”. Thus, there is no basis for asserting that the features lack proper antecedent basis.

Finally, the Examiner asserts that metes and bounds of the “calibrated deuterium-tritium gas bubbles” in claim 24 cannot be determined.” Applicant respectfully disagrees. As explained above, the first paragraph of page 13 of the specification explains what is meant by this feature. Applicant again reminds the Examiner that the claims must be evaluated on the basis of the disclosure and what is known in the art. Under this basis, Applicant submits that each feature recited in the claims would be understood by one having ordinary skill in the art, and the Examiner has not shown otherwise.

Accordingly, Applicant respectfully requests that the Examiner withdraw this basis of rejection.

35 U.S.C. § 101 Rejection

Claims 1, 2, 8, 12, 14, 16-19, 21-24, 26, 27, 30-32, 35, 36, 40 and 41 were rejected to on the basis of 35 U.S.C. § 101. Applicant respectfully traverses each of the Examiner's assertions.

The Examiner asserts that the claimed invention lacks utility, is inoperative and is not useful. Applicant respectfully disagree.

Applicant submits that the instant invention has been described and claimed as a structural device with structural features. The device is clearly useful at least for conducting experiments directed to producing fusion. The Examiner is not correct that Applicant has merely set forth a concept. The clear structural language of the claims and the specification belie such an assertion.

The Examiner cannot ignore the fact that the claims are directed to a fusion reactor assembly which has a number of structural features such as inner and outer spherical housings, a piezo material arranged there between, a pump, a heat exchanger, a conditioner and a control unit, among other things. Such features are hardly conceptual. Moreover, as explained above, the disclosed and claimed device is useful in conducting research with an aim towards achieving fusion reactions. As such, its is clearly useful and the Examiner has not demonstrated otherwise.

Accordingly, Applicants respectfully submit that the rejection of the above-noted claims is now moot and should be withdrawn.

35 U.S.C. § 102 Rejections

Claims 1, 12, 14, 16, 17, 19, 27 and 30 were rejected under 35 U.S.C. § 102(e) for being allegedly anticipated by U.S. Published Patent Application No. 2004/0141578 to ENFINGER, or under 35 U.S.C. § 102(b) for being allegedly anticipated by WO 03/077260 to LABERGE, or under 35 U.S.C. § 102(b) for being allegedly anticipated by U.S. Patent No. 5,659,173 to PUTTERMAN et al., or under 35 U.S.C. § 102(b) for being allegedly anticipated by WO 03/034441 to SYMONS.

In order to establish a *prima facie* case of anticipation under 35 U.S.C. § 102, a single prior art reference must disclose each and every element as set forth in the subject claim. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ 2d 1051, 1053 (Fed. Cir. 1987). Applicant respectfully submits that a *prima facie* case of anticipation cannot be established because each of ENFINGER, LABERGE, PUTTERMAN, and SYMONS fails to teach each and every element of the claims.

More particularly, independent claim 1 recites, *inter alia*,

at least one actuator comprising a piezo material arranged between spherical walls and contained by the substantially spherical body to generate at least one pressure wave in the working fluid.

With regard to ENFINGER, Applicant submits that this document does not disclose or even suggest at least the above-noted feature of claim 1. Applicant acknowledges, for example, that ENFINGER discloses a fusion reactor which utilizes a piezoelectric transducer 42 that generates acoustic waves (see paragraph [0030]). However, Applicant respectfully submits that, contrary to the instant invention,

ENFINGER does not disclose at least the above-noted features of at least claim 1. Applicant notes, for example, that Fig. 1 of ENFINGER shows that the piezoelectric transducer 42 is arranged in an inside surface of the inner spherical housing 22. The invention, in contrast, arranges the piezo material actuator between spherical walls (claim 1). Thus, ENFINGER does not disclose the combination of features recited in claim 1, much less, the noted claims which depend there from.

With regard to LABERGE, Applicant submits that this document does not disclose or even suggest at least the above-noted feature of claim 1. Applicant acknowledges, for example, that LABERGE discloses a fusion reactor which utilizes piston actuators 36 between inner 28 and outer housings that generates acoustic pulses 40 (see paragraph [0035]). However, Applicant respectfully submits that, contrary to the instant invention, LABERGE does not disclose at least the above-noted features of at least claim 1. Applicant notes, for example, that LABERGE contains no apparent disclosure with regard to using a piezoelectric transducer, much less, one that is arranged between spherical walls. The invention, in contrast, arranges the piezo material actuator between spherical walls (claim 1). Thus, LABERGE does not disclose the combination of features recited in claim 1, much less, the noted claims which depend there from.

With regard to PUTTERMAN, Applicant submits that this document does not disclose or even suggest at least the above-noted feature of claim 1. Applicant acknowledges, for example, that PUTTERMAN discloses a fusion reactor which utilizes piezoelectric transducers PZTs that generate acoustic waves (see col. 9, lines 23-26

and col. 21, lines 34-47). However, Applicants respectfully submit that, contrary to the instant invention, PUTTERMAN does not disclose at least the above-noted features of at least claim 1. Applicant notes, for example, that the cited language merely explains that the PZTs are mounted to an outer wall of the spherical container. The invention, in contrast, arranges the piezo material actuator between spherical walls (claim 1). Thus, PUTTERMAN does not disclose the combination of features recited in claim 1, much less, the noted claims which depend there from.

With regard to SYMONS, Applicant submits that this document does not disclose or even suggest at least the above-noted feature of claim 1. Applicant acknowledges, for example, that SYMONS discloses a fusion reactor 2 which utilizes an explosive material layer 1 coated on an outer surface and which, upon detonation, generates acoustic shock waves (see page 8, lines 21-28). However, Applicant respectfully submits that, contrary to the instant invention, SYMONS does not disclose at least the above-noted features of at least claim 1. Applicant notes, for example, that SYMONS contains no apparent disclosure with regard to using a piezoelectric transducer, much less, one that is arranged between spherical walls. The invention, in contrast, arranges the piezo material actuator between spherical walls (claim 1). Thus, SYMONS does not disclose the combination of features recited in claim 1, much less, the noted claims which depend there from.

Claim 2

Claim 2 was rejected under 35 U.S.C. § 102(e) for being allegedly anticipated by

ENFINGER or under 35 U.S.C. § 102(b) for being allegedly anticipated by PUTTERMAN.

As claim 2 is canceled by the instant amendment, this basis of rejection has been rendered moot. Moreover, claim 1 is believed to be allowable over either of these documents for at least the above-noted reasons.

Claim 8

Claim 8 was rejected under 35 U.S.C. § 102(e) for being allegedly anticipated by ENFINGER. Applicant respectfully disagrees.

As noted above, while ENFINGER discloses a fusion reactor which utilizes a piezoelectric transducer 42 that generates acoustic waves (see paragraph [0030]), ENFINGER does not disclose at least the above-noted features of at least claim 1. Applicant notes, for example, that Fig. 1 of ENFINGER shows that the piezoelectric transducer 42 is arranged in an inside surface of the inner spherical housing 22 and not between two spherical walls. As claim 8 depends from claim 1, the rejection of claim 8 is improper at least because it depends from claim 1.

Claim 18

Claim 18 was rejected under 35 U.S.C. § 102(b) for being allegedly anticipated by PUTTERMAN. Applicant respectfully disagrees.

As noted above, while PUTTERMAN discloses a fusion reactor which utilizes piezoelectric transducers PZTs that generate acoustic waves (see col. 9, lines 23-26

and col. 21, lines 34-47), PUTTERMAN does not disclose at least the above-noted features of at least claim 1. Applicant notes, for example, that the cited language merely explains that the PZTs are mounted to an outer wall of the spherical container and not between two spherical walls. As claim 18 depends from claim 1, the rejection of claim 18 is improper at least because it depends from claim 1.

Claim 21

Claim 21 was rejected under 35 U.S.C. § 102(e) for being allegedly anticipated by ENFINGER or under 35 U.S.C. § 102(b) for being allegedly anticipated by LABERGE. Applicant respectfully disagrees.

As noted above, while ENFINGER discloses a fusion reactor which utilizes a piezoelectric transducer 42 that generates acoustic waves (see paragraph [0030]), ENFINGER does not disclose at least the above-noted features of at least claim 1. Applicant notes, for example, that Fig. 1 of ENFINGER shows that the piezoelectric transducer 42 is arranged in an inside surface of the inner spherical housing 22 and not between two spherical walls. As claim 21 depends from claim 1, the rejection of claim 21 is improper at least because it depends from claim 1.

Moreover, while PUTTERMAN discloses a fusion reactor which utilizes piezoelectric transducers PZTs that generate acoustic waves (see col. 9, lines 23-26 and col. 21, lines 34-47), PUTTERMAN does not disclose at least the above-noted features of at least claim 1. Applicant notes, for example, that the cited language merely explains that the PZTs are mounted to an outer wall of the spherical container

and not between two spherical walls. As claim 21 depends from claim 1, the rejection of claim 21 is improper at least because it depends from claim 1.

Claims 22-24, 26, 31, 35, 36, 40 and 41

Claims 22-24, 26, 31, 35, 36, 40 and 41 were rejected under 35 U.S.C. § 102(e) for being allegedly anticipated by ENFINGER or under 35 U.S.C. § 102(b) for being allegedly anticipated by LABERGE.

Applicant respectfully submits that a *prima facie* case of anticipation cannot be established because each of ENFINGER and LABERGE fails to teach each and every element of at least independent claims 1 and 31. Accordingly, each of ENFINGER and LABERGE would fail to teach the combination of features of claims 1 and 31 as well as the respective dependent claims noted in this rejection.

More particularly, independent claim 1 recites, *inter alia*,

at least one actuator comprising a piezo material arranged between spherical walls and contained by the substantially spherical body to generate at least one pressure wave in the working fluid.

Additionally, independent claim 31 recites, *inter alia*,

at least one actuator contained between the inner wall and the outer wall, the at least one actuator generating at least one pressure wave in the working fluid; a conditioning system providing stable pressure and temperature conditions of the working fluid; and means for supplying a gas bubble into the center of the substantially spherical body which intersects with the at least one pressure wave, wherein the amplified pressure wave reflects on the inner wall and deforms the actuator to generate electrical energy.

With regard to ENFINGER, Applicant submits that this document does not disclose or even suggest at least the above-noted features of claims 1 and 31. Applicant acknowledges, for example, that ENFINGER discloses a fusion reactor which utilizes a piezoelectric transducer 42 that generates acoustic waves (see paragraph [0030]). However, Applicant respectfully submits that, contrary to the instant invention, ENFINGER does not disclose at least the above-noted features of at least claims 1 and 31. Applicant notes, for example, that Fig. 1 of ENFINGER shows that the piezoelectric transducer 42 is arranged in an inside surface of the inner spherical housing 22. The invention, in contrast, arranges the piezo material actuator between spherical walls (claim 1) or an actuator arranged between inner and outer walls (claim 31) alone or in combination with the recited conditioner and/or the recited means for supplying the gas bubble. Thus, ENFINGER does not disclose the combination of features recited in claims 1 and 31, much less, the noted claims which depend there from.

With regard to LABERGE, Applicant submits that this document does not disclose or even suggest at least the above-noted features of claims 1 and 31. Applicant acknowledges, for example, that LABERGE discloses a fusion reactor which utilizes piston actuators 36 between inner 28 and outer housings that generates acoustic pulses 40 (see paragraph [0035]). However, Applicant respectfully submits that, contrary to the instant invention, LABERGE does not disclose at least the above-noted features of at least claims 1 and 31. Applicant notes, for example, that LABERGE contains no apparent disclosure with regard to using a piezoelectric transducer, much less, one that is arranged between spherical walls. Nor does LABERGE disclose or

suggest the amplified pressure wave reflects on the inner wall and deforms the actuator to generate electrical energy. To the contrary, LABERGE discloses creating the fusion in order to heat the working liquid 14 so that the heat can be used to generate energy (see page 14, lines 1-7). The invention, in contrast, arranges the an actuator or a piezo material actuator between spherical walls which both generates pressure waves and produces electrical energy. Thus, LABERGE does not disclose the combination of features recited in claims 1 and 31, much less, the noted claims which depend there from.

Claim 32

Claim 32 was rejected under 35 U.S.C. § 102(e) for being allegedly anticipated by ENFINGER. Applicant respectfully disagrees.

As noted above, while ENFINGER discloses a fusion reactor which utilizes a piezoelectric transducer 42 that generates acoustic waves (see paragraph [0030]), ENFINGER does not disclose at least the above-noted features of at least claim 31. Applicant notes, for example, that Fig. 1 of ENFINGER shows that the piezoelectric transducer 42 is arranged in an inside surface of the inner spherical housing 22 and not between two spherical walls. As claim 32 depends from claim 31, this basis of rejection is improper.

Accordingly, Applicants respectfully submit that each of the above-noted rejections under 35 U.S.C. § 102 should be withdrawn.

CONCLUSION

In view of the foregoing amendments and remarks, Applicant submits that all of the claims are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue. The Examiner is invited to contact the undersigned at the telephone number listed below, if needed.

Respectfully submitted,
Ulrich AUGUSTIN

A handwritten signature in black ink, appearing to read 'A. Calderon', with a horizontal line drawn underneath.

Andrew M. Calderon
Reg. No. 38,093

October 25, 2005
GREENBLUM & BERNSTEIN, P.L.C.
1950 Roland Clarke Place
Reston, VA 20191
703-716-1191